Delaware School Accountability Growth Model Frequently Asked Questions (FAQ)

What is the Delaware growth model?

The Delaware growth model aims to measure student academic progress over time. The model uses a statistical technique to identify the effects of the education system on student achievement, isolating these effects as much as possible from other factors that influence student achievement such as prior student knowledge. The education system includes all elements of a school environment that contribute to student learning, such as principals, classroom teachers, and support teachers. The Delaware growth model produces two main metrics:

Growth results

In the growth results, test scores from several prior years are used to compare the growth of an individual student to the growth of similar students. The results can be interpreted as a measure of a school's contribution to a student's growth in achievement from one year to the next.

Growth to proficiency

In the growth to proficiency metric, a growth trajectory is calculated for each student based on the student's prior test scores. Based on this trajectory, it is determined whether or not a student is on-track to meet a target of proficient on the state test in the future. This metric can be used by schools to determine which students are at-risk of not meeting those targets, and devote appropriate interventions and resources to those students.

Why is measuring growth important?

The Delaware growth model is a key element of the state's strategy to raise academic achievement for all students. One of the simplest ways school effectiveness has been evaluated in the past has been to use student achievement data, such as proficiency rates in English and math. While useful and important, achievement data alone do not provide a complete picture of how students are performing and how schools and districts are doing in improving student learning over time. The Delaware growth model helps the state to determine how much growth students have made from one year to the next, and most importantly, allows districts and schools to determine their impact on the academic growth of students.

The Delaware growth model holds schools and districts accountable for the school system's effect on learning in that year, adjusting for prior knowledge, which influences student growth. It ensures that schools serving students with different prior achievement levels have an equal chance of showing high growth.

Which students count in the Delaware growth model?

In order to count in the Delaware growth model calculation, a student must:

- Have at least two years of valid test results to measure growth

- Be enrolled for the full academic year (FAY)

Why does the Delaware growth model only include ELA and Math?

In order to produce the Delaware growth model, standardized test scores must be available for students from one year to the next. Tests in ELA and Math are most suitable because students take those tests in successive years. For example a student's 3rd, 4th, and 5th grade ELA can be used to predict 6th grade ELA performance.

In some cases where consecutive test years are not available or will not be available, such as in high school, the Delaware growth model measures growth of students from earlier grades to the present. For example, the 11th grade model will measure a particular student's growth between his or her 8th grade test and 11th grade test (since the 9th and 10th grade tests do not exist with Smarter Balanced).

How is growth aggregated from the student level to schools?

The aggregation method differs between the two main metrics produced from the Delaware growth model:

Growth results

In the growth results, each student's growth is compared to the growth of students with similar test histories from across the state. The actual growth of a particular student could be *slower than, the same as*, or *faster than* the growth of similar students.

The Delaware growth model aggregates these student results to determine the contribution of a school to students' growth in achievement. When doing this, the model considers by how many points each student *did not meet* or *exceeded* average growth for similar students. For example, a student who exceeded average growth by 5 points will count more positively toward his or her school's rating than would a student who only exceeded average growth by 1 point.

Growth to proficiency

In the growth to proficiency result, a growth trajectory is calculated for each student based on each student's prior test scores. Based on this trajectory, it is determined whether or not a student is on-track to meet a target of proficient on the state test in the future.

To aggregate these results to the school level, a percentage of students who are determined to be on-track to proficiency is calculated at the school level. For example, if three quarters of students are determined to be on-track to proficiency, the school's growth to proficiency rate will be "75 percent".

How do I interpret the Delaware growth model results?

The result of the Delaware growth model can be interpreted as a measure of a school's contribution to a student's growth in achievement from one year to the next.

Results are reported on a scale where higher numbers mean higher growth and lower numbers mean lower growth. There is not a predefined maximum or minimum, but most results range from 1 to 5 and almost all results range from 0 to 6.

On this scale “3” represents students growing at an average rate compared to students with similar test histories from across the state. If a school receives a “3”, that means their contribution to students’ growth in achievement is close to the state average.

Numbers higher than “3” represent students growing at a rate faster than average. These schools’ contributions to students’ growth in achievement is higher than the state average.

Numbers lower than “3” represent student growing at a rate slower than average. These schools’ contributions to students’ growth in achievement is lower than the state average. A result less than “3” does not mean that students lost knowledge, it means that they are growing at a rate slower than average for similar students across the state.

What does the Delaware growth model adjust for?

In order to create equitable measures of schools contribution to student growth, the growth models used must be designed to adjust for the context in which schools operate. However, there is no straightforward answer as to what factors should be included in the “right” model; Delaware has considered questions of fairness and accuracy in making these decisions while continuing to set high expectations for all students. To account for differences in student context, the Delaware growth model adjusts for the prior test histories of each student.

Why doesn’t the Delaware growth model directly adjust for student characteristics?

The Delaware growth model takes into account students’ prior test history when calculating growth. In this way, each individual student’s circumstances outside of school that may impact achievement are incorporated. Currently, there no U.S. Department of Education approved school accountability growth models that include direct adjustments for student characteristics.

How accurate is this method?

Delaware’s approach to building our growth methodology draws upon the expertise of advanced analytic providers; school and district leaders; and teacher and parent representatives to ensure that the decisions made are the best they can be. The goal of this process is to build a growth methodology that is technically accurate and aligned to the state’s policy goals.

For the portion of the accountability system that does use the Delaware growth model results, many techniques are in use to make those results as fair and accurate as possible. For example, to account for inherent limitations in standardized test scores, the growth model employs a correction for “measurement error” in prior test scores. Additionally, to guard against the influence of random events affecting the results, the growth model is based on groups of students over multiple years of testing. In this way, individual student factors such as student effort or a “bad test day” are evened out across the group and over time. Several other techniques are also applied to acknowledge and account for other limitations to produce the most accurate results possible.

All methods for measuring student achievement and growth have some amount of inherent error. For this reason, Delaware’s accountability system does not rely solely on the student growth outcome and rather employs multiple measures to assess student learning and schools’ contribution.

Does the model set different expectations for students?

Delaware recognizes that students start at different places, and wants to identify and foster growth for all students. In achievement models, high achievement results are often more indicative of students' background characteristics than the effectiveness of teaching within an education system. Academic growth is more appropriate for measuring effectiveness of instruction rather than looking only at end-of-year performance.

In order to accurately measure a school's impact on student growth, the model adjusts for prior test history in creating growth predictions. At the same time, these "predictions" do not mean setting different expectations for different students at the beginning of a year. Instead, the predictions are created using a statistical model at the end of the school year and actual student progress is compared to a student's predicted performance.

The Delaware Department of Education continues to have high expectations of growth for all students and the goal of the growth model is to create accurate measurement of growth to support those expectations.

Is there a disadvantage for schools with high achieving students in the Delaware growth model?

The Delaware growth model results will adjust for the prior test scores of students to be a fair and accurate measure of growth for students of all proficiency levels. Rather than assume that students all along the test scale will make the same amount of growth in test score, the Delaware growth model adjusts for growth trends at different points in the test scale. For example, the test itself may have properties that would cause a trend where higher achieving students would gain fewer points on the test compared to lower achieving students. If this is found to be the case, the growth model results will adjust for that effect. In general, the growth model compares the growth of a student to the growth of similarly achieving students.

In addition to the above, the Smarter Balanced assessment is designed to measure growth and allow students to show their knowledge of the standards at higher levels. Based on data from the 2014-15 Smarter assessment, very few students obtained the maximum scale score in a content area for a particular grade.

When does the analysis occur to produce the student growth model results?

The Delaware growth model uses retrospective growth analysis. This means that the growth model and relevant statistical predictions for student growth are not calculated until all assessments have been scored and are available from the growth period in question (e.g., the 2015-2016 growth period cannot be scored until the spring 2016 assessment data are available).

What are the benefits of using a Spring-to-Spring growth period?

The Delaware growth model uses each student's prior spring test scores compared to his or her current spring test scores to measure growth. This is known as a spring-to-spring model. The benefits of a spring-to-spring model (over a fall-to-spring model) include:

- Greater degree of accuracy in test scores since students tend to put more effort toward the spring test
- The benefit of fall tests for formative instruction purposes are protected since fall tests result will not be used for high-stakes summative assessment
- Less testing burden as only one high stakes test event is needed per year

The primary concern with an accurate growth model is a good measure of prior knowledge and the spring tests tend to represent that knowledge well.

How does the growth model work between assessment transitions?

Statistically, modeling growth between assessment regimes is straightforward and supported by the academic literature. As long as the two tests are based on similar blueprints and assess a similar set of standards, performance on a prior test should be predictive of performance on a new test. This is the case as the model uses the available student data to obtain the best predictions of post achievement. In addition, there are benchmarks that can be set and tested to determine whether or not the transition between tests has an adverse impact on the quality of the growth model.

With the Delaware test transition from the Delaware Comprehensive Assessment System (DCAS) to Smarter Balanced, the initial year growth model results will be based on up to three years of prior DCAS scores for each student. During the test transition year, we will be performing statistical checks to ensure the DCAS and Smarter Balanced assessments have appropriate properties to support their combined use in the Delaware Growth Model.

Has Delaware previously calculated academic growth?

Yes, since the 2007-2008 school year, DDOE has calculated student growth as a component of its school accountability system. Under the U.S. Department of Education's "Growth Model Pilot Project," Delaware was one of 16 states approved to calculate the status of student achievement on state summative assessments and the year-to-year growth of those students on the assessment, and take both into account when calculating a school's Adequate Yearly Progress (AYP). Delaware was approved to use a "value table" model, which calculated the number of students that transitioned from one performance category (i.e., Below Standard, Meets Standard, and Advanced) to another. The model assigned points to the student transitions, and then aggregated growth at the school level.

Further, in 2010, Delaware enacted legislation that requires student growth on state summative assessments to be a component in teacher evaluations. This growth model created "targets" for individual students based on the performance of similar students. The model for this calculation is also used in the Academic Performance Framework for public charter schools.

How is the new Delaware growth model related to the growth model used in the Academic Performance Framework?

The Academic Performance Framework (AF) employed a growth model based on historical data from three prior cohorts to set target instructional scale scores for the current student cohort. The AF growth model then calculated the percentage of students who met their growth targets. The new Delaware growth model will be retrospective in that it will use data from the current cohort to determine how a student performed relative to the average student. In subsequent years, as data on the new Smarter Balanced test are accumulated, the growth model can be updated to use these historical data.

The growth model used in the Academic Framework measured fall-to-spring growth. In the absence of fall test scores under Smarter Balanced, the new model will measure spring-to-spring growth. The new model will also use multiple years of prior test scores for each student whereas the AF model used only a single fall test score to measure growth.